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(54) IMPROVEMENTS IN VACUUM CLEANERS

(71) We, SOCIETE DE PARIS ET DU RHONE, a body corporate organised under the laws of France, of 36 avenue Jean Mermoz, LYON 8e (Rhône), France, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

The invention relates to vacuum cleaners of the broom or brush type in which the body or casing of the cleaner is disposed between a handle and a suction attachment so that the cleaner is manipulated in the manner of a brush. Vacuum cleaners of this type are referred to hereinafter and in the appended claims as "brush type vacuum cleaners".

Brush-type vacuum cleaners have been previously proposed having a device for checking the extent to which the bag is filled. This checking device is formed by a cylinder of transparent material one part of which is visible through a window formed in the body of the vacuum cleaner and one end of which is connected in an airtight manner to the depression chamber, that is to say the chamber containing the dust bag. In this cylinder there is located a piston which displays at least two bands of different colours a portion of at least one of which is visible through the aforesaid window, and the piston is constantly urged by a spring to the end of the cylinder opposite to that connected to the depression chamber.

In such vacuum cleaners, the depression chamber is that delimited by the half of the body in which the dust bag is located, the other chamber delimited by the other half of the body containing the electric motor and its accessories. Consequently, for reasons of simplification of construction, the device for checking the extent to which the bag is filled is located in that half of the body of the vacuum cleaner which in fact forms its front half and is obscured by the user's hand when the cleaner is in use. As a result, this checking device is not normally

visible to the operator when he is using the vacuum cleaner, and, if he wishes to check the extent to which the bag is filled, he is obliged, while the vacuum cleaner is operating to stop using it in order to see the checking device.

The present invention aims at mitigating this disadvantage. To this end the invention provides a brush type vacuum cleaner having a body or casing provided in its rear part with an annular interior partition defining an annular passage forming an extension of the depression chamber, a suction-operated device for checking the extent to which the bag is filled being fixed to the rear cover of the casing and communicating with the depression chamber through said passage.

Thus, in the normal use position, the device for checking the extent to which the bag is filled is constantly visible to the operator.

Preferably the forward part of the annular partition forms a collar for locating the electric-motor and fan assembly, the rear end of the fan casing being provided with an annular flange connected to said collar, and the annular partition forming, at at least two longitudinal diametrically opposed regions, the exterior wall of the casing which, thereby, in the said regions, presents recesses giving access to screws for clamping said flange, the recesses being closed by covers.

Preferably also means is provided for detachably fixing a cap located at the front end of the casing to the latter, said means comprising two devices located at diametrically opposed points on the said cover, each of which comprises a hook or catch one end of which is provided with a nose adapted to engage in a notch provided in the casing, and which is pivoted adjacent its other end to a connector itself pivoted on a shaft integral with the cap and which, in the closed position, is located between the notch in the casing and the pivotal axis of the connector in such a manner that the movement of the catch in the direction of

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closure causes movement into alignment of the two axes and the aforesaid notch, thereby causing a pull on the catch between its point of hooking in the notch and its pivotal axis on the connector, and effecting its locking in the closed position.

The invention will be better understood, with the aid of the description which follows, with reference to the accompanying schematic drawings, representing, by way of a non-limiting example, one embodiment of a vacuum cleaner. In the drawings:

Fig. 1 is an end view;

Fig. 2 is a sectional view on the line 2—2 of Fig. 1;

Fig. 3 is a sectional view on the line 3—3 of Fig. 2; and

Fig. 4 is a fragmentary sectional view on the line 4—4 of Fig. 3, to a larger scale.

Referring to the drawings, the body or casing 2 of the vacuum cleaner is in a single piece whose rear end is closed by a grille cover 3 and whose front end, through which the dust bag 4 is introduced, is closed by a removable cap 5. The cap 5 is provided with a conical bored-out socket 6 for receiving a nozzle, a brush or other conventional vacuum cleaner accessory. The casing 2 is also provided at its rear end with a control handle 7, and with a recess 8 suitable for receiving the handle by which the vacuum cleaner is manipulated.

As is shown more especially in Fig. 4, the vacuum cleaner is provided with a device 9 for checking the extent to which the bag is filled. This device consists of a cylinder 11 of transparent material of which only a part 11a is visible through a window 3a, and one end 12 of which is connected to the depression chamber 13 of the vacuum cleaner, that is to say, the chamber containing the dust bag 4. Inside the cylinder 11, there is located a piston 14 urged by means of a spring 15 into abutment with the end of the cylinder opposite to the end 12. This piston 14 is divided into two substantially equal cylindrical parts 14a, 14b of different colours, for example white and red respectively. When the dust bag is empty only the white part is visible through the part 11a of the cylinder 11. As a result of increase in the vacuum in the depression chamber 13 corresponding to excessive filling of the dust bag, the piston 14 is moved towards the end 12 of the cylinder 11 so making its red part 14b visible through the part 11a of the cylinder 11. This device 9 is fixed to the cover 3 in which is provided the window 3a through which the part 11a of the cylinder 11 is visible.

In order to permit communication between the interior of the cylinder 11 and the depression chamber 13, there is provided in the rear part of the casing 2 an internal annular partition 16 the forward part of

which is adapted to house the motor 17 for driving the fan 18, and the outer surface of which defines, with the inner face of the rear part of the casing 2, an annular passage 13a forming an extension of the depression chamber 13. The rear end of the extension 13a of the depression chamber 13 is provided with an orifice 19 in which there is fitted in an airtight manner a tubular member 21 opening radially into the cylinder 11 from its end 12. The control device 9 so positioned can constantly be observed by the operator.

The annular partition 16 is advantageously used for mounting the assembly of the motor 17 and fan 18. For this purpose, on the inner free edge 16a of the partition 16, there is mounted a resilient annular jointing member substantially of angle-iron section, whose bore 22a serves as a seating for the assembly of motor 17 and fan 18.

In order to locate the assembly of motor 17 and fan 18 in the bore 22a of the jointing member 22, the latter is provided at two diametrically opposed locations with two radial enlargements 22b apertured axially and adapted to receive a clamping bolt 23. In order to permit insertion of the bolts 23, the annular partition 16 at these zones forms the external wall of the body of the vacuum cleaner, the recesses 24 giving access to the heads of the bolts 23 being closed by covers 27 in order not to spoil the external appearance of the vacuum cleaner. Between the heads and the nuts of the bolts 23, there are clamped radial parts 2a of the casing 2 connecting the latter to the annular partition 16 in the zones 24, the radial enlargements 22b of the jointing member 22, a flange 25 and an annular skirt 26 of flexible material which serves as a bearing support for the motor fan assembly.

The fixing of the cap 5 on the casing 2 is effected with the aid of two diametrically disposed devices 28. Each of these two devices comprises a hook or catch slightly bent to correspond at one end to the profile of the peripheral part of the cap 5, and, at the other end, to the corresponding end of the casing 2. At one of its ends, this catch 29 is provided with a nose 31 adapted to engage in a notch 32 formed in the casing 2.

The catch is pivoted at the end opposite to said nose 31, and through the intermediary of a connection 33, to a shaft 34 integral with the cap 5. The connection 33 has a profile in the shape of a U or stirrup of which the cross member 33a is provided with a longitudinally split bore adapted to engage on the shaft 34, whilst each of its side members carries on its outer face a trunnion 35 adapted to engage in a hole of the same section, provided to receive it, in a corresponding wing of the lever 29. The common axis of the trunnions 35 is sub-

stantially parallel to the shaft 34, and they are disposed in such a manner that, when the catch or lever 29 is in the closed position, the shaft 34 is located between the notch 32 and the axis 36, and movement of the catch 29 in the direction of closure causes, due to the movement into alignment of the axes 34 and 36 with the notch 32, a pull on the catch 29 between its nose 31 and the journals of the trunnions 35, which has the effect of holding it normally in the closed position. In order to move a catch 29 to its open position, it is necessary to exert a force, in the direction of the arrow 37, on its free end 29a.

The parts of this catch are located in recesses 5a in the cap 5, and, consequently, the said catches 29 project only very little from the periphery of the casing 2.

WHAT WE CLAIM IS:—

1. A brush type vacuum cleaner having a body or casing provided in its rear part with an annular interior partition defining an annular passage forming an extension of the depression chamber, a suction-operated device for checking the extent to which the bag is filled being fixed to the rear cover of the casing and communicating with the depression chamber through said passage.

2. A vacuum cleaner according to claim 1 wherein said device for checking the extent to which the bag is filled comprises a cylinder of transparent material a part of which is visible through a window provided in the body of the vacuum cleaner and one end of which is connected in an airtight manner with the depression chamber of the vacuum cleaner through said annular passage, there being a piston in said cylinder having at least two bands of different colours, the piston being constantly urged by a spring to the end of the cylinder opposite that connected to the depression chamber.

3. A vacuum cleaner according to claim 1 or 2, in which the forward part of the annular partition forms a collar locating an

electric motor and fan assembly, the rear end of the fan casing being provided with an annular flange connected to said collar and the annular partition forming, at at least two longitudinal diametrically opposed regions, the exterior wall of the casing which, thereby in the said regions, presents recesses giving access to screws for clamping said flange, the recesses being closed by covers.

4. A vacuum cleaner according to claim 3, in which clamping of the motor fan assembly to said annular partition is effected by interposition of a resilient annular jointing member applied against one of the faces of the flange provided on the fan casing, the jointing member being provided with an annular skirt serving as a bearing support for the motor fan assembly.

5. A vacuum cleaner according to any preceding claim, in which means is provided for detachably fixing a cap located at the front end of the casing to the latter said means comprising two devices located at diametrically opposed points on the said cover, each of which comprises a catch one end of which is provided with a nose adapted to engage in a notch provided in the casing, and which is pivoted adjacent its other end to a connector itself pivoted on a shaft integral with the cap and which, in the closed position, is located between the notch in the casing and the pivotal axis of the connector in such a manner that the movement of the catch in the direction of closure causes movement into alignment of the two axes and the aforesaid notch, thereby causing a pull on the catch between its point of hooking in the notch and its pivotal axis on the connector, and effecting its locking in the closed position.

6. A vacuum cleaner substantially as hereinbefore described with reference to the accompanying drawings.

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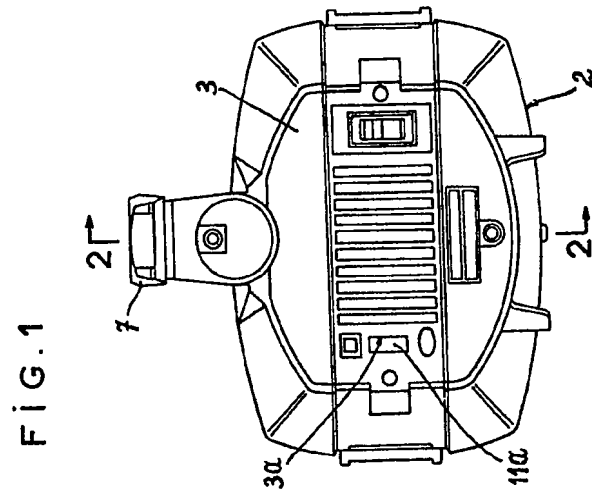
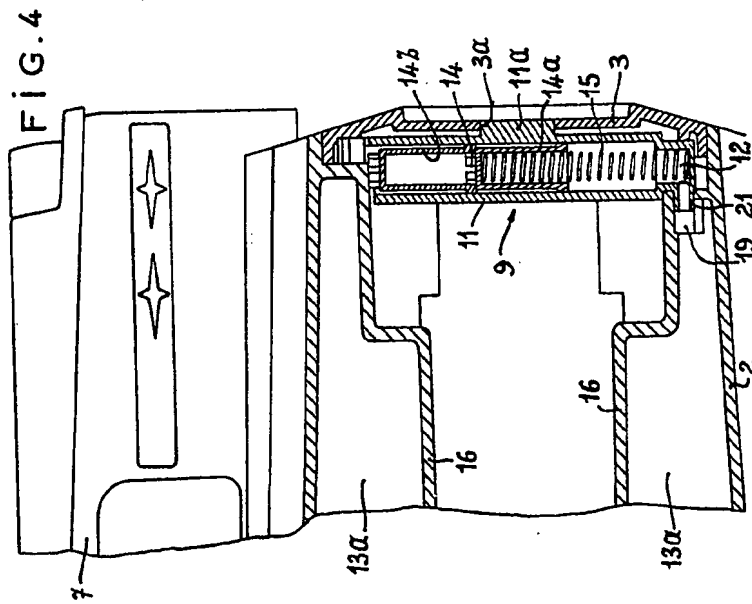


FIG. 2

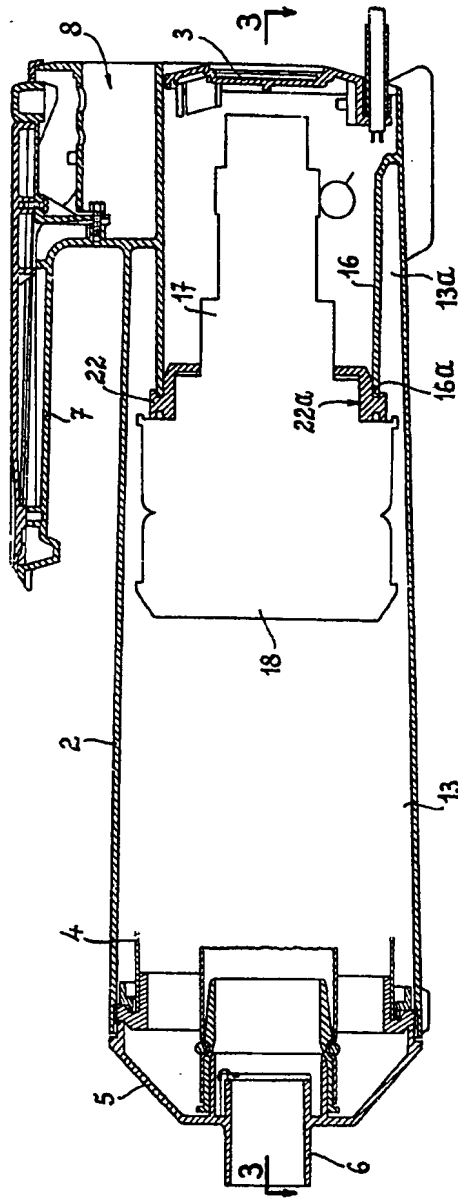


FIG. 3

